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him. The Mbati "medicine" seems to have been considered efficient, for he, the seventh child, survived; and subsequently three others were born. The previous six had all died.

Though two of those three have since died, in some way they were considered to have died by Njambi (Providence)—*i.e.*, a natural death. For it is not unqualifiedly true that all tribes of Africa regard all deaths as caused by Black Art. There are some deaths that are admitted to be by call of God, and for these there is no witchcraft investigation.

The father also is dead. My informant and one sister survive. They think the Mbati "medicine" was satisfactory, notwithstanding that the sister believes that their father was secretly poisoned by his cousins, they being jealous of his affluence in wives and children.

The last step in the Mbati rite is the transplanting of some plant. A suitable hole having been dug at one end, or even in the middle of the village street, each person takes a bulb of lily kind, probably a crinum or an amaryllis, such as are common on the rocky edges of streams, and pressing it against their backs and other parts of their body, and with a rhythmic swaying of their bodies, they plant it in that hole. Thereafter these plants are not destroyed. They are guarded from the village goats by a small enclosure. And should at any time the village remove, the plants are also removed, and replanted on the new site. Such plants are seen in almost every village.

GEOGRAPHICAL RECORD.

AMERICA.

Artesian Water from Moraine.—Recent exploration for artesian water to supply the City of Ithaca, the seat of Cornell University, has resulted in not a little contribution to our knowledge of the deposits underlying that city and of the mode of occurrence of ground waters in the Pleistocene deposits. The city lies on a flat, at the head of Cayuga Lake, and just southwest of the town thirteen wells have been bored. Several of these supply 300,000 gallons a day, the water flowing to the surface without pumping. The rock bottom of the valley, at least here, is 430 feet below the surface, the overlying strata being two zones of lake clay separated by a gravel stratum 20–70 feet thick at a depth of about 80 feet, all resting on a series of gravel, clay, and sand whose top is of irregular outline. Here scratched stones were found and in places there is unquestionably till. There is also fine black sand, 50–75% quartz, which is generally water-bearing. Professor Tarr (Journ. Geol., Vol. XII, No. 2, 1904, 69–82) interprets this lower gravelly series as moraine buried by the lake deposits. Two miles south of the wells the valley is choked with moraine accumulations, which disappear under the delta. From this point kame-moraine hills extend south to the divide, over a dozen miles. This sandy area serves as a gathering-ground for waters which slowly percolate beneath the lake deposits, having head enough at Ithaca to rise over 300 feet. The wells show little sympathy in pressure and volume, and have a constant temperature of 52° in August and in December. Professor Tarr believes the source of the water in the higher (20–70 foot) gravels to be the alluvial fans opposite the mouths of the streams that enter the valley on the great level at the foot of the lake. L. M.

SUBTERRANEAN SHORE-LINES.—The outline of glacial Lake Iroquois has long been pretty thoroughly established by observations of elevated shore-lines, the same phenomena being one of the classical evidences of tilting of the land in the East since the retreat of the ice-sheet. The extensive studies and observations of Dr. G. K. Gilbert as to the amount of tilting find curious corroboration in the paper of Tarr (Journ. Geol., Vol. XII, No. 2, 1904, 69–82), who writes of what may be described as subterranean shore-lines at the head of Cayuga Lake.

In the boring of some artesian wells through the delta on which Ithaca stands a recurring succession of strata was passed through in all the wells, thirteen in number. Roughly this was first clay, then gravel and sand, clay again, and once more sand and gravel. This last deposit was almost directly on bed-rock at a depth of 280–340 feet, and was generally water-bearing. In seeking an explanation for the upper sand-gravel layer of 20–70 feet, sandwiched between clays, the lower about 130 feet thick, the upper 40–60 feet thick, Professor Tarr had recourse to the well-established tilting of this region since the Iroquois stage. The beaches of Lake Iroquois disappear below lake level at Union Springs, on Lake Cayuga, twenty-nine miles north of these wells. Up to that point they are dipping, as observations by Dr. Gilbert show, about 2.7 feet per mile. Consequently the beach should be 78 feet below present lake-level at Ithaca. It is at just about this depth and below it that the sandy deposits are passed through. If the conclusion that these coarse sands and gravels are identical with the ancient lake shore were not then irresistible, the additional evidence of plant and of animal life in the series would furnish corroborative evidence of indisputable character. Logs in seven of the wells at this horizon and not lower, and molluscan remains identified as near-shore species, are the witnesses. Tilting, however, went on faster than sand and gravel deposits were made, lake conditions were renewed, and the upper series of clays on which modern Ithaca stands was deposited. L. M.

REJUVENATION A PRODUCER OF HANGING VALLEYS.—The difficulty of reading aright the drainage history of the Finger Lake region of Central New York is well instanced by the case of Professor Tarr, who, ten years ago, interpreted Lake Cayuga as rock basin (Bull. Geol. Soc. Amer., Vol. V, 1894, 339–356), but whose later studies have revealed many facts opposed to the glacial erosion hypothesis. He has, therefore, turned to rejuvenation as an alternative hypothesis. In the American Geologist (Vol. XXXIII, No. 5, 1904, pp. 271–291) he reviews the earlier work, states the distribution of the older gorges (buried gorge valleys in the bottoms of mature hanging valleys of the upland), and proposes for consideration the following hypothesis:

> The region of the Finger Lakes, having attained a condition of topographic maturity, represented by the hanging valleys, and by the gentle slopes of the main walls above the 800-foot contour, was subjected to rejuvenation. The main valleys, with their elevation above base-level decidedly increased and the power of their streams possibly further increased by tilting, were transformed below the 800-foot contour to broad, deep gorges, whose bottoms were cut to levels below present sea-levels. The side valleys, always behind the main valleys in stage of development, were, moreover, occupied by smaller and weaker streams, which, in the majority of cases, were either only slightly or even adversely affected by the tilting. These weaker members of the stream systems were unable to do more than cut the gorges which are so generally present in the bottoms of the hanging valleys. On this theory a moderate amount of glacial erosion is, of course, allowed, possibly deepening the valleys somewhat, and certainly broadening them by erosion on the sides, and, in favorable situations, even partially erasing the older gorges.

L. M.

COMMERCIAL GEOGRAPHY IN THE UNIVERSITY OF WISCONSIN.—The University of Wisconsin celebrated, at the end of the school year this summer, the first half century of its existence. A business course was opened to students at the beginning of the academic year 1900–1, to supply facilities for the training of young men who desire to enter upon commercial careers. This course has been successful from the first, and the number of students in it has steadily increased. It opened with eighty-five students, and the number enrolled in the past year was 173. Commercial and economic geography is a prominent feature of the sophomore year. It embraces a general survey of the resources, industries, and commerce of the chief countries of the world, followed by a special study of the production and distribution of the staple articles of commerce, with special reference to the foreign trade of the United States. Dr. Henry C. Taylor is the instructor in this branch of the course.

THE TAMPICO HARBOUR WORKS.—E. L. Corthell, C. E., who had charge of the construction of the Tampico harbour works, has written a paper to supply visitors at the St. Louis Exposition with a résumé of the salient features of the works and to explain the models and photographs on exhibition. Tampico stands on the Pánuco River, near its mouth, about midway between Vera Cruz and the United States frontier. Before the present works were completed the commercial history of the port was a record of continual danger, loss, and disaster. The bar at the mouth of the river was variable in position, depth of water, and location of channel. At its best there was sufficient depth over the bar only for lighters and tugs which attempted, at great disadvantage, to carry freight and passengers to and from the steamers and ships anchored outside in the Gulf. The bar was exposed to the full force of the "northers," whose velocity is from 40 to 75 miles per hour. Vessels sometimes waited for weeks, or even months, and were finally obliged to weigh anchor and go on to other ports because their freight and passengers could not be handled at Tampico.

The improvement consists of parallel jetties through the bar and straight out into the sea, the north jetty being 6,500 and the south jetty 6,800 feet in length. The distance between them is 1,000 feet. The total cost of the construction was about $2,221,000. The channel has been deepened, and the current flowing between the jetties carries the sediment out into the Gulf beyond the harbour works. The commerce of the port has been greatly stimulated by the improvement.

DISPOSITION OF RAINFALL IN THE BASIN OF THE CHAGRES.—Gen. Henry L. Abbot, who has made a very careful study of the engineering problems in connection with the Panama Canal, and especially of everything that concerns the rainfall, points out in a recent paper (*Monthly Weather Review*, XXXII, 1904, No. 2) that the Isthmus of Panama is a singularly favourable locality for studying the disposition of the rainfall—*i. e.*, the part that flows off in the streams, the part that is evaporated, the part that is absorbed by plants, and, finally, the part that sinks into the earth as ground-water. Ice and snow are unknown on the Isthmus. The region is, in its natural condition, densely covered with tropical vegetation. The temperature is very uniform, thus removing the difficulty of varying amounts of evaporation as dependent on varying temperatures. And, lastly, the rainfall is very heavy, with sharp divisions between the dry season and the rainy season. All these conditions have been extremely favourable to the prosecution of the study in hand, and General Abbot believes it "not improbable that results obtained under so favourable conditions may not only be applicable to similar regions in the tropics, but may also throw light upon certain climatic elements common to more northern latitudes." Of the entire rainfall which falls above Bohio, about a third disappears, a second third flows off directly by the channel of the Chagres, and the last third ultimately reaches the bed of the river, after a retardation of about three months, by its passage through the soil. In round numbers, the valley of the Chagres River has about 2.5 times the rainfall, 3.3 times the outflow, and 1.5 times the evaporation which characterizes the northeastern portion of the United States. The ground-water also plays a much more important part in the regimen of the stream than it does with us.

R. DeC. W.

DOMINICA'S BOILING LAKE.—The *Dominican*, published at Roseau, Dominica, has printed a paper by Mr. F. Stearns-Fadelle on the boiling lake of that island. It was unknown until 1875, when a gentleman who had lost his way in the forest approached the lake near enough to be aware that he was in the neighbourhood of a centre of subterranean ebullitions. His report led a party to go in search of it. The search was rewarded by the discovery of the lake, which is elliptical in form, about 200 by 100 feet in measurement, and stands 2,425 feet above sea-level, in the midst of a volcanic area some five square miles in extent. When fullest it drains into the Pointe Mulâtre stream. At times it is quiescent, and then it may be ebullient for days at a time. It has not yet been ascertained whether ebullition occurs at definite periods. Vertical cliffs of ferruginous soil and rock rise from the water, and in sounding ten feet from the edge of the lake no bottom was found at a depth of 195 feet. Sulphuretted hydrogen is exhaled at intervals, and the gas proved fatal to a visitor and guide in 1901; while other visitors have suffered from its effect. When the water is quiescent it is still a lake, showing that this is not merely the outer part of a subterranean funnel. The volcanic region in which it is situated is called Grande Soufrière.

THE SAILING SHIP AND THE PANAMA CANAL.—Mr. James Page, of the United States Hydrographic Office, contributes an important paper under the above title to the *National Geographic Magazine* for April, 1904, emphasizing the fact that the sailing vessel is not a thing of the past, and that our increasing knowledge of marine meteorology is constantly tending towards greater security, quicker passages, and larger profits for sailing ships. Thus, for example, during the early '70's the average voyage from The Lizard to Valparaiso took over 100 days; in 1876–1880, 18 passages averaged 102 days; in 1881–1884, 38 passages averaged 91 days; in 1885–1888, 64 passages averaged 88 days; in 1889–1892, 83 passages averaged 83 days. With regard to the use of the Panama Canal by sailing ships, Mr. Page points out that the northeast trades blow home to the Caribbean coast throughout practically the entire year. During the months January–April (the dry season) they are strongest, and during this season the dreaded "northers" occur along the eastern coast of Central America. Steamers calling at Colon at that time always keep up steam, that they may be able to slip their cables and put to sea at a moment's notice. The trades weaken during the advance of the wet season and incline to the southeast, and during August and September there are brief periods with southwest winds, these being the terrestrial monsoons from the Pacific side of the Isthmus. While a sailing vessel approaching the Atlantic end of the canal will thus have favourable winds, a vessel leaving that end will be unable to steer a direct course against the trades, and must make a detour. This will not be a serious thing for vessels bound to European or American ports, but for those bound from Puget Sound to South Africa, for example, the passage by way of Cape Horn will be better. It is probable that a vessel of large tonnage would experience a very considerable delay in beating from Colon to Cape San Antonio during the winter months, when the trades are fresh and northerly, or even northwesterly, along the coast. On the whole, the difficulty at the Atlantic end of the canal will come chiefly through superabundance of wind; while at the Pacific end the difficulties will be associated with calms. This region is one of very uniform pressure; hence the gradients are weak, and calms prevail. The "Mexican belt of calms," as it is known, is triangular in shape, the base being at the American coast, extending from the Gulf of California to the Gulf of Panama, and the vertex being in the Pacific, at about long. 125° W. The axis of this belt of calms moves slightly north and south with the seasons, and the frequency of calms increases rapidly towards the coast. Sailing vessels approaching and leaving the Pacific end of the canal must cross more or less of this belt, and the delay likely to arise from this cause must be balanced against the saving of time which would come because of passage through the canal.

The sailing routes which are most likely to be affected by the canal, if the latter is practicable for sailing vessels, are the route between the English Channel and the west coast of North America and the homeward route from the west coast of South America. Vessels going out to the west coast of South America will continue to sail by way of Cape Horn, because, if bound to Chile or Peru, such vessels would have to make a wide detour in the Pacific after leaving Panama in order to circumnavigate the southeast trades. As to the time likely to be saved by sailing vessels which pass through the canal, it is found that the average time from the Channel to San Francisco by way of the Cape is 139 days, and by way of the canal it would be 97 days, or a net saving of 42 days. On the return voyage the average time from San Francisco to the Channel, allowing delays in the calm-belt on the Panama side and for the detour on the Atlantic side, would be 117 days, giving a net saving of 15 days as compared with the Horn passage. The use of the canal by small coasting vessels between San Francisco to New York might possibly revive the coastwise trade between our Atlantic and Pacific ports, as the sailing time from New York to San Francisco *via* the canal would be 74 days, and returning 85 days, as against 140 and 130 days by way of the Horn.

R. DeC. W.

EUROPE.

RUMANIA NOT A PART OF THE BALKAN PENINSULA.—The Rumania Geographical Society has addressed a Memorial to the geographical societies of other countries and to foreign cartographic establishments, asking attention to the scientific grounds upon which Rumanians object to the inclusion of their land on atlas sheets as a part of the Balkan Peninsula. On March 13 last, at a meeting of the Society, over which King Charles I. presided, Mr. Alexander A. Sturdza read an able and forceful paper, presenting the reasons why Rumania neither in geological structure, in race, nor in political condition is a part of the Balkan Peninsula. At the request of the King this paper was incorporated with the Memorial, and the whole is being distributed in the French language under the title "La Roumanie N'Appartient pas à la Péninsule Balkanique."

The argument and scientific data accompanying the Memorial are detailed and comprehensive. Briefly, from a geological and geographical point of view, it is shown that the Carpathian ranges which dominate the Rumanian plains are much younger than the Balkan Mountains, and are a part of the Alpine system; while the Balkans were once the western portion of a mountain system extending through the Crimea to the Caucasus. The formation of the Danube Valley, about the close of the Tertiary epoch, by the rupturing of the rocks at the Iron Gates, gave birth to a distinct line of geographical demarcation between Rumania and the Balkans. Mr. Sturdza describes how the relief, the hydrographic system, and the soils of Rumania differentiate that country from the Balkan lands. The low plains of Rumania spread away on the north side of the Danube; while the terraces of Bulgaria rise to the Balkans on the south. The climatology of Rumania is not affected in any way by the Balkan ranges, but is under the influence of the Carpathians and the Danube.

It is suggested, from an ethnological point of view, that there is absolutely no ethnic resemblance between the Rumanians and the Turks, Servians, and Bulgarians. The early basis of the Rumanian people, Pelasgian-Iranian-Thracian, was later greatly modified by Roman and Dacian elements; but the Balkan peoples, excepting the Greeks and the Albanians, belong, in their origin, to the Mongol Asiatics, with whom the Rumanians have no ethnic affinities. Tables of anthropological measurements and other data are also given to show important physical differences between the Rumanian and Balkan peoples, establishing a line of separation between them.

Many facts are adduced to show that the mentality of the Rumanians and their psychological tendencies differentiate them in a marked degree from the Balkan peoples. The Rumanians more nearly approach the western nations of Europe, in intellectual culture and civilization, than their Balkan neighbours. The legislation of Rumania and the manners and customs of its society are Western; the State is independent, and ranks in the civilized world as a factor promoting peace and order, progress and liberty.

From the array of facts adduced it is argued that the Danube should be regarded as the boundary between Rumania and the Balkans, or that the boundary should be fixed further south along the line of the most northern of the Balkan ranges.

There is no doubt that such considerations as Mr. Sturdza has adduced have long inclined many geographers to regard the Rumanian plains as a geographical unit apart from the regions on the south side of the Danube. This has been noticeable in authoritative writings. Dr. Philippson, for example, calls Rumania a Danubian State, and differentiates it from the Balkan Peninsula to the south of the Danube. The Stieler four-sheet map of the Balkan Peninsula, however, still includes Rumania as a part of it.*

A PHYSICAL GEOGRAPHY OBSERVATORY ON MONTE ROSA.—Upon the initiative of the Swiss Alpine Club, with the assistance of Margherita, the Dowager Queen of Italy, the Duke of the Abruzzi, and the Italian Ministry of Agriculture, an observatory of physical geography will be built this summer on Monte Rosa at an elevation of 4,560 metres. This and the well-known observatory of Joseph and Henri Vallot on Mont Blanc will be the highest station of the kind in Europe. The station will be in charge of a young scientist, who will keep the observatory open during the summer, and even in winter, if the weather permits. The special purpose will be to co-operate with meteorological studies at high altitudes by means of balloons. There are now in Italy two observatories at high altitudes—one on Mount Etna (2,942 metres) and the other on Monte Cimone in the Apennines (2,162 metres).

THE SOILS OF RUSSIA-IN-EUROPE.—The Russian Department of Agriculture has published a new map of the soils of Russia, and the information it contains is summarized in *Annales de Géographie* (No. 69, 1904). These soils may be briefly summarized as (1) those of the dry steppes, gray and brown in color, formed of clays and sand; (2) the soils of the *tchernoziom* (black earth), the great wheat region of Russia, with grassy steppes and prairies, and a more or less temperate and humid climate, sandy or marly, with a large but variable admixture of humus; (3) the soils of the forest steppes, resembling the *tchernoziom* soils in their content of humus, but distinguished from them by the acidity of the sub-soil; (4) the soils of the mixed forests, with grass and much undergrowth, chiefly formed by the disintegration of quartz; and (5) the soils of the tundras, formed of clay and sand, the perpetually-frozen soils of the north.

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* It is not quite clear what geographers are expected to do in this matter. The term *Balkan Peninsula* is a convenient geographical expression, which carries with it neither praise nor blame, and those who use it will read Mr. Sturdza's argument with surprise. He succeeds in proving to his own satisfaction by the evidence of geology and meteorology, of history and ethnology, that Rumania and the Rumanians have nothing in common with the Balkan Peninsula.

This being the case, there seems to be no reason for asking the opinion of Societies and Institutes. Rumania is known by its own name in the political world and on the map of Europe. What more is needed ?

It may be well, however, to remind Mr. Sturdza that his tone of affected disdain for the peoples confessedly included in the Balkan Peninsula does not recommend the advanced intellectual culture which he claims for Rumania.—EDITOR BULLETIN.

AFRICA.

BOUNDARY BETWEEN GERMAN EAST AFRICA AND THE CONGO FREE STATE.—*Globus* (April 28) says that the Congo State authorities have been unsuccessful in their effort to have Lake Kivu declared to be wholly within the territory of the State. The Congo-German Boundary Commission has discovered an error of about 17′ in the mapping of the southern end of the lake, and the rectification of the frontier shows that the boundary follows the Rusisi River, thus dividing the lake about equally between German East Africa and the Congo Free State. The volcanic mountains to the north of the lake are also partly in Belgian and partly in German territory.

CAPTAIN LENFANT'S BOAT JOURNEY FROM THE ATLANTIC TO LAKE CHAD.—*La Géographie* for June publishes a long paper by Capt. Lenfant on his recent successful journey. The *Scottish Geographical Magazine* was permitted, in advance, to make an extended abstract of the paper, which appears in its June number. The object of the mission was to reach Lake Chad by boat, *via* the Niger, the Benue, and the Mayo-Kebbi of the Niger system and the Logone and Shari of the Lake Chad system. A special steel boat was built, drawing only two feet when loaded. It could be taken to pieces for transportation past obstructions in the waterways.

The journey began at the mouth of the Niger and led up the Benue, which, in winter, is accessible to large vessels as far as Yola. Although fertile, the banks of the Benue are sparsely inhabited, villages being rarely met on its lower course. On Aug. 28, 1903, twenty-four days after leaving the Atlantic, the party reached the confluence of the Mayo-Kebbi with the Benue.

It had long been reported that at the period of high water the Logone, affluent of the Shari or Lake Chad system, was connected with the Mayo-Kebbi or Niger system through the Tuburi depression, which stands on the water-parting between these two great river systems. The purpose of the mission was to ascertain whether this was a fact, and, if so, whether the water route, Niger-Benue-Kebbe-Tuburi-Chad, might practically be utilized. The mission succeeded in proving that this water connection exists, and that it may be utilized to some extent for transportation.

Lenfant found six feet of water everywhere in the Kebbi, with no rocks or other obstacles to navigation, until he arrived at the village of Lata. Here a fall 30 metres in height, above which are rapids, blocked his way. He accordingly had before him 30 kilometres of land porterage. His boat and supplies were carried around the obstruction, and the boat was launched again in the Tuburi depression, whence Lenfant made his way without difficulty into the Logone and on to the Shari and Lake Chad. On Nov. 4 his vessel anchored before Fort Lamy, near Lake Chad, where his compatriots gave the party a most cordial reception.

He had proved that there is only one obstruction in the way of continuous navigation between the Atlantic and Lake Chad, and that for several weeks of each year the waters of the Chad system reach the Ocean.

He has pointed out the existence of a new road that for eight to twelve weeks, between Aug. 1 and the end of October, may be utilized for the transportation of supplies to Lake Chad. He has solved the geographical problem, but does not claim to have made the exhaustive studies required to work out the details of its utilization. The new route would be perfect were it not for the falls at Lata. As it is, freight from France will require only two unloadings to reach Lake Chad—the first at the mouth of the Niger and the second at Lata for the short porterage to Sulkano in the Tuburi depression.

ASIA.

POPULATION OF THE PHILIPPINES.—Bulletin I of the Bureau of the Census, 1904, gives the result of the census in the Philippine Islands taken in 1903. The archipelago numbers approximately 3,141 islands and islets extending from latitude 4° 40′ to 21° 10′ N. and from longitude 116° 40′ to 126° 34′ East. Within this area of 832,968 square miles of land and water dwells a population of 7,635,426 people. Of this number, 6,987,686 are civilized, or partly so; while 647,740 are wild and uncivilized, although not without some knowledge of the domestic arts.

The aborigines of the Philippines are believed to be the Negritos, and of these 23,000 still remain. They are found in many, although not all, of the provinces living in a primitive state. They are very short, the males averaging about 4 feet 10 inches in height; while the females are shorter.

Of the other wild tribes, the most important are the Igorot, who inhabit the central cordillera from the extreme north of Luzon south to the plains of Pangasinân and Nueva Ecija; a curious tribe of head hunters known as the Ibilao, also in Luzon; two tribes in Paragua, one in Mindoro and 17 in Mindanao; and the Moros and other Mohammedan tribes of the south.

Considering the land alone, the area is estimated to be 115,026 square miles, or 73,616,640 acres. Of this, about 12,000,000 are private and over 61,000,000 public lands. Of the latter, 40,000,000 acres or more are forest lands, leaving about 21,000,000 available for agriculture. The forest lands are estimated to be worth more than $2,000,000,000.

The civilized Filipinos are classified in eight tribes, as follows: The Bicol, Cagayan, Ilocano, Pampangan, Pangasinân, Tagalog, Visayan, and Zambalan. The largest is the Visayan.

The population of the more important islands, classified as civilized and wild, is as follows:

ISLAND.	TOTAL POPULATION.	CIVILIZED.	WILD.
Basilan	27,017	1,206	25,811
Bohol	243,148	243,148	......
Camiguin	30,754	30,754	......
Catanduanes ...	39,288	39,288	......
Cebú	592,247	592,247	......
Joló...........	44,718	1,270	43,448
Leyte	357.641	357,641	.....
Luzon	3,798,507	3,575,001	223,506
Marinduque....	50,601	50,601	.....
Masbate	29.451	29,451	......
Mindanao	499,634	246,604	252,940
Mindoro.......	28,361	21,097	7,264
Negros	460,776	439,559	21,217
Panay	743,646	728,713	14,933
Samar	222,690	222,002	688
Siquijor	46,023	46,023	......
Tablas.........	24,648	24,648	......

CHINESE TREATY PORTS.—The *Monatsschrift für den Orient* for April prints the list of treaty ports opened to the world's trade by China between 1843, and March, 1904. The treaty ports now number 43. Before 1843, European nations were able to engage in trade with China by sea only through the port of Canton and by land through the caravan route which crosses Mongolia and enters Siberia at Kiachta. The first port to be opened was Shanghai in May, 1843. The latest ports to be opened to trade are Antung, near the mouth of the Yalu, and Nanning, in the southern part of the province of Kwangsi. The list now published gives the date of the opening of each port, its population, and the approximate amount of its trade in 1902.

ELECTRIC STREET CARS IN TIEN-TSIN.—The Compagnie Internationale d'Orient has obtained from the Chinese Government the right to introduce electric street railroads and electric lighting in Tien-tsin. This will be the first enterprise of the kind in China, and it is expected that the success of the Belgian company in securing this concession will encourage efforts in the same direction in other large Chinese cities. The population of Tien-tsin is estimated at 1,000,000, and it is second only to Canton in size. It has, however, only the most rudimentary means of passenger transportation. The Japanese *jinrikishas* were introduced about thirty years ago, and at present over 2,500 of these vehicles pay a license of $1 a month each, and render much service to foreigners and the well-to-do Chinese. The prices charged for their use, however, are far above the means of the masses. It is intended that the electric street cars shall supply a means of urban transport at once convenient, rapid, and cheap.

POLAR.

THE FATE OF BARON TOLL.—Prince Kropotkin has translated for the *Geographical Journal* (June, 1904) all that the Russian papers have printed concerning the search for Baron Toll. He says that engineer Brusneff, who visited Bennett Island with Lieutenant Kolchak's party, is of the opinion that Baron Toll must have perished on his return journey from Bennett Island to New Siberia. The island is 93 miles from New Siberia. The explorer probably met with an open sea which it was impossible to cross in the dark and cold season, when floating ice was forming. Toll had provisions for only a fortnight, and the party must have suffered severely for want of warm clothing. Having killed on Bennett Island only six reindeer, they could not have prepared enough clothing for the four men, and they could not winter on the island, as they had no provisions for that, and would have had no fuel.

The last paper written by Baron Toll and found on Bennett Island was dated November 8, 1902, and contains briefly the important geographical results of his visit to that place. His remarks on the geographical work done there are of the greatest value. Here is a translation of the paper, a part of which, in the form of a cable summary, appeared in the April number of the BULLETIN (p. 239):

In company with the astronomer, F. G. Seeberg, and two hunters, the Tungus Nicholas Diakonoff and the Yakut Vassili Gorokhoff, on June 7 [June 20], I left the winter harbour of the Zarya (Nerpichiya Bay of Kotelnyi Island). We followed the northern coasts of Kotelnyi and Thadéeff islands, keeping our course towards Cape Visoki on New Siberia. On June 13 [June 26], I took the course towards Bennett Island. The ice was pretty broken. On June 25 [July 8], three miles from Cape Visoki the ice was definitely broken. Preparing to take to our baidaras (leather boats), we killed our last dogs. From here we were carried on an ice-floe, for four and a half days, 48 miles in the desired direction. Then, having noticed that our ice-floe had drifted 10 miles southwards, we left it on July 31 [Aug. 13], and after having covered the remaining 23 miles in our baidaras, landed on August 3 [August 16] on Bennett Island, at Cape Emma.

According to the survey of Seeberg, who has also determined the magnetic elements both here and on the journey—in ten places in all—Bennett Island is a plateau, not higher than 1,500 feet. By its geological structure it appears as a continuation of the plateau of Middle Siberia, which is built up, here also, of very ancient marine deposits (Cambrian), pierced by irruptions of basalt. In places one finds, under the sheets of basalt, deposits of brown coal with relics of vegetation, namely, conifers. In the valleys of the island bones of mammoths and other Quaternary-period animals, washed out of the deposits, are found occasionally.

As to the present inhabitants of Bennett Island, they are, besides the temporary visitor, the walrus, the polar bear, and the reindeer. A herd of some thirty of the latter wandered on the rocky feeding ground of the island. We fed upon them and made out of their skins the fur cloth and the boots required for the winter journey. The following birds stay here : two species of Somateria, one sand-snipe, one bullfinch, and five species of gulls, including the roseate one.

As for migratory birds, we saw one eagle which flew south to north, one falcon which flew north to south, and geese, whose flock went also north to south. Owing to fogs we could not see the land wherefrom these birds came ; neither could we see Sannikoff's Land any more than during our last navigation.

We are going to leave here the following instruments : a reflecting circle with artificial horizon, a Krause's inclinator, the anemometer, the photographic apparatus "Norah," and some others.

To-day we are going southwards. We have provisions for fourteen to twenty days. All in good health. 76° 38′ N. lat., 149° 42′ E. long.

(Signed) BARON E. TOLL.

Bay of Paul Köppen on Bennett Island,
October 26 [November 8], 1902.

Prince Kropotkin, commenting on the above short sketch of Bennett Island, says:

> It shows that the same old continent which we see on the Vitim and in north-western Mongolia once extended far beyond the present northern limits of Asia; and that the relics of this continent have now in the far north the same character as I saw on the Vitim; namely, a backbone of old, probably Cambrian, crystalline rocks, levelled in the course of ages to the plateau form and covered in places with relics of Tertiary woods. These relics, in their turn, are covered with Post-Tertiary layers of basaltic lavas. Consequently, even in this high latitude (beyond 76° 38′), possibly at the northern extremity of what was then an immense continent which spread from middle Asia north-eastwards, coniferous trees used to grow during the Tertiary period; a result the importance of which every geologist will appreciate.

About 20 months have elapsed since Baron Toll left this document on Bennett Island, and little hope remains that Toll and Seeberg, with their two faithful hunters, are still alive.

SOME INDICATIONS OF LAND NEAR THE NORTH POLE.—Mr. R. A. Harris of the U. S. Coast and Geodetic Survey read a paper on this topic before the Philosophical Society of Washington in April. The sea through which the De Long Expedition drifted to the northwest for many months extends from Bennett Island in the west to Banks Land in the east. North of the eastern part of the Alaskan coast it is known as Beaufort Sea. That land probably extends to the north of Beaufort Sea may be inferred from the fact that the ice found here is very old, the sea seeming to have no broad outlet through which the ice can escape, as it does north of Siberia. It seems probable that land, continuous or nearly so, must extend far westward from off Banks Land. This supposed land and the eastward current along the Arctic coast of North America may explain why it is that the ice never recedes far northward from the northern coast of Alaska nor westward from Banks Land.

In the extreme north this land cannot extend much beyond the pole toward Franz Josef Land, because if it had stretched far in that direction it would undoubtedly have caused a bend in the track of the *Fram's* drift. Mr. Harris also reasons that the tides on the Arctic coast of Alaska seem to confirm the view of the existence of this undiscovered land.

Some years ago Captain Herendeen, of the whaling fleet, as reported in a paper by the late Marcus Beker, said he had often been told that natives wintering between Harrison and Camden Bays on the Alaskan coast had seen land to the north in the bright, clear days of spring. The only report of land having been seen to the north by white men was made by Captain John Keenan, of

Troy, N. Y., in the seventies. He said that while stowing whale oil in thick weather the fog suddenly cleared and land was distinctly seen by himself and all the men of his crew. As he was not on a voyage of discovery, and there were no whales in sight, he was obliged to give the order to keep away to the south in search for them.—(*Nat. Geog. Mag.*, June, 1904.)

OBITUARY.

ELI SOWERBUTTS.—Mr. Sowerbutts was born in 1834. He founded the Manchester (England) Geographical Society in 1884, and gave to it his untiring services as secretary until his death. He was especially interested in commercial geography and in geographical education, and frequently lectured on these topics.

ADMIRAL MAKAROV.—This famous Russian naval officer, who perished on April 13, 1904, in the sinking of the warship *Petropavlovsk* near Port Arthur, was the inventor of the ice-breaking steamer *Ermak*, with which he undertook, in 1901, a voyage to the Arctic Sea east of Spitzbergen. He visited the Kara Sea in the same vessel, enlarged the coast surveys of Novaya Zemlia, and made many important scientific observations in the Arctic regions.

ADOLPH LINDENKOHL.—Adolph Lindenkohl, senior draughtsman of the Coast and Geodetic Survey, and for fifty years connected with that branch of the Government service, died at his home in Washington on June 22, in the 71st year of his age. He was born in Niederkaufungen, Hesse Cassel, Germany, and educated at the Polytechnic School, graduating in 1852. In 1854 he became a naturalized citizen of the United States, and was appointed to the Coast and Geodetic Survey. He was the author of many papers on geographical exploration and cognate scientific topics.

GENERAL.

UNIVERSITY HONOURS FOR GEOGRAPHERS AND GEOLOGISTS.—The University of Wisconsin has conferred the degree of Doctor of Laws upon Thomas C. Chamberlin, Professor of Geology in the University of Chicago. Oxford has conferred Doctorates of Science upon Sir John Murray, Professor H. Mohn, the Meteorologist of Christiania, and Sir David Gill, the Astronomer of the Royal Observatory at Cape Town. Professor Angelo Heilprin, late President of the Geographical Society of Philadelphia, has been appointed Lecturer in Physical Geography in the Sheffield Scientific School of Yale University.

AN ATLAS OF VOLCANOES.—The Belgian Society of Astronomy, Meteorology, and Physical Geography has decided to publish a monograph, to be prepared by Mr. Élisée Reclus, descriptive of the volcanoes of the world, together with maps showing their distribution. It is believed that such a work will facilitate future studies in vulcanology and seismology. The map, in colours, will be on a scale of 1:40,000,000, which will be supplemented by an important number of maps on a scale of 1:2,000,000. In the paper which the distinguished geographer presented to the Society he said that students now lacked a very important facility for the study of volcanoes, and that is a map adequately indicating all the volcanic lands of the terrestrial surface, together with all centres of eruption, extinct or active. Without the aid of such a map it is impossible for students to construct well-based theories with regard to the distribution in space or in time of the work done by volcanoes. On the proposed map all the areas whose surface is formed of eruptive rocks will be shown, and the location of the various forms of volcanic phenomena will be marked. Volcanoes that are believed to have been extinct since the historic period, those that have been active since the beginning of human history, and those which have more recently been centres of eruption will all have their distinctive signs.

NEW MAPS.

AMERICA.

UNITED STATES.—Map of Porto Rico, showing location of mining claims. No scale. *Bulletin* 6, Bureau of the Census. Government Printing Office. Washington, 1904.

The map shows the results of the Government investigations thus far as to the distribution in Porto Rico of iron, lead, copper, gold, silver, and salt.

ARGENTINA.—Plano de la Ciudad de Buenos Aires. Scale, 1,100 metres to the inch. In the *Annuaire Statistique* of the City of Buenos Aires. Director General of Municipal Statistics, Buenos Aires, 1904.

A black-and-white map. Reference to all important buildings, railroad stations, etc., facilitated by an index relating to letters and figures on the margin of the map.

PERU.—Provincia de Hualgayoc. Natural scale, 1:500,000, or 7.8 statute miles to an inch. *Boletín* of the Corps of Mining Engineers of Peru, No. 6. Lima, 1904.

The map shows the distribution of gold, silver, coal, and other mining products of the province, and accompanies a long description of the mineral resources of this rich part of Peru.